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South Pacific Regional Environment Programme



# **Third SPREP Meeting of Regional Meteorological Service Directors**

Held on  
**14-16 November 1995**  
in **Apia, Western Samoa**





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## Executive Summary and Meeting Recommendations

1. Participants of the Third SPREP Meeting of Regional Meteorological Service Directors endorsed the recommendations of the Second SPREP Meeting of Regional Meteorological Service Directors, noted with appreciation the progress which has been made in implementing these recommendations, and the benefits which have resulted.
2. The meeting noted with pleasure the continuation of the close and cooperative working arrangements between the South Pacific Regional Environment Programme (SPREP) and the World Meteorological Organization (WMO). This has provided many tangible benefits to meteorological services in the Pacific region, and recommended that these two organisations continue to work closely in support of meteorological services in the region. Participants strongly supported the establishment of a sub-regional office of WMO in the Pacific. SPREP affirmed its willingness, in principle, to consider providing administrative, infrastructure and technical support for such an office.
3. The meeting welcomed the convening of the First Meeting of the SPREP Working Group on Climate, endorsed the report and action statements of this group, and the prompt action in addressing these calls for action. Participants noted with appreciation the convening of a workshop on El Nino Southern Oscillation (ENSO) as part of this meeting.
4. The meeting called upon SPREP to convene a Second Meeting of the SPREP Working Group on Climate in 1996, which should, *inter alia*, consider the status of the action statements arising from the first meeting, and recommendations from this, the Third SPREP Meeting of Regional Meteorological Service Directors. Participants noted the appointment of Dr. Don Thompson (New Zealand) as Chairman of the World Meteorological Organization Regional Association-Five (WMO RA-V) Working Group on Climate Matters, and urged SPREP to establish working contacts with this group. In particular, it was recommended that SPREP coordinate with WMO with a view to convene its meeting in conjunction with the first session of the WMO RA-V Working Group on Climate Matters.
5. The meeting strongly endorsed the convening of a regional workshop on Public Weather Services for the Pacific region to be co-sponsored by SPREP and WMO. This workshop should gather together meteorological officers, media, and representatives of the user community for the betterment of public forecasting and warning services in the Pacific.
6. The meeting also recommended that SPREP, in conjunction with WMO and other partners including regional meteorological services, implement a second phase of the satellite receiving equipment project, to provide systems similar to those already installed in the region to other small meteorological services.
7. The under-developed state of computer based climate databases in the region caused concern to participants. The meeting affirmed the importance of high quality climate databases as a fundamental tool in providing climate information for planning and policy purposes. The usefulness of climate means and deciles as tools for making quantitative assessments of the region's climate was discussed in some detail. It was established that few meteorological services presently have the required amount of climate data in electronic databases to calculate mean and deciles for climate indices. The meeting noted Project 2, Sub-Project 2.3 of the Changing Climate in Paradise which aims to secure existing climate data resources and enter this information into computer data archives. It was recommended that this project be given priority as a vital component in the establishment of complete and secure climate databases for Pacific island meteorological services.
8. The meeting recognised the need to ensure all historical data is entered into electronic databases as soon as possible. It was noted that several countries including Australia and New Zealand, are currently formatting historical climate data from the Pacific to facilitate input into electronic databases in the region. The meeting urged these countries to continue their efforts, and welcomed the significant improvements in the volume of climate data held in the region that such initiatives will provide.

9. The meeting reaffirmed the recommendation of the first SPREP Working Group on Climate meeting that a new climate bulletin be produced within the Pacific region through collaboration between Pacific island meteorological services. It was agreed that a modest approach should be taken initially, with the following climate indices to be reported:

- Pacific climate diagnostics (e.g. Southern Oscillation Index (SOI), Sea Surface Temperature (SST) anomalies, ENSO text discussion);
- Member generated data (rainfall, and where possible temperature, Mean Sea Level (MSL), pressure and tropical cyclone information); and
- Other selected data such as sea-level information, swell and winds.

The meeting in particular welcomed the statement by Fiji to host such a publication, subject to arrangements for provision of resources for the set up and running costs during the early stages. It was agreed that Fiji could provide the basic requirements needed to house such a publication, and participants welcomed the pledge by Fiji to try to absorb much of the costs of continuing this publication in the longer term. SPREP is to continue liaising with meteorological services and interested organisations in the Pacific region to examine practical ways of developing and preparing such a summary, identify the personnel and resources required to prepare a project proposal for the establishment of such a bulletin. SPREP will provide a progress report to the Fourth SPREP Meeting of Regional Meteorological Service Directors.

10. Considerable concern was expressed by participants on the fragile state of the Climate Computer Project (CLICOM) in the region. The meeting endorsed efforts by SPREP and WMO to prepare a proposal for a detailed regional support programme for CLICOM, in liaison with the meteorological services of the region. The programme developed should:

- ensure that hardware and software used within the region is adequate, uniform and compatible to the greatest degree possible;
- provide appropriate training to CLICOM users, including basic computer skills, use of operating systems, programming, data management, statistical analysis, interpretation, and applications of climate

information. This training should include national training, regional workshops and international fellowships;

- support regional CLICOM users through a network of expertise within the region to act as trouble shooters and problem solvers;
- disseminate information to CLICOM users through a regular bulletin or newsletter;
- provide for software development to deliver basic and customised climate information to government, business, industry, etc.

SPREP is urged to continue its efforts to prepare this proposal, and seek comment from Pacific island countries, regional partners and international organisations to ensure that the project will provide optimum assistance in conjunction with other related programmes.

11. The meeting welcomed the decision by five Pacific island countries to join the World Meteorological Organization (WMO), and urged remaining eligible Pacific island countries who have not yet done so, to consider joining WMO.

12. The meeting welcomed the preparation of a register of relevant meteorological training courses and material available to the region, and recommended that it be regularly updated and made available to the meteorological services of the region.

13. Meteorological services are strongly encouraged to prepare forward plans outlining the framework of their future programmes. In this regard, Directors are urged to be forward thinking in determining training needs, and relate training to the tasks needed for tomorrow, rather than those of yesterday. The meeting recognised the value of a cadre of competent and well trained personnel within a successful meteorological service. It was recommended that consideration be given to this factor in preparing staff development plans and training programmes in order to ensure the retention of trained staff.

14. Training in the areas of computer techniques (including programming skills), understanding CLICOM, climate science, statistics, agro-climatology, and community involvement and applications were identified as areas where regional coordination would be beneficial. Participants noted with appreciation the training provided by WMO, Australian Bureau of Meteorology, and

National Institute of Water and Atmospheric Research (NIWA) (New Zealand), which has provided a foundation of basic knowledge within the region. The meeting recommended that the Regional CLICOM Development Project proposal to fully address the training assistance identified in the CLICOM Inventory and Review document.

15. The meeting requested that SPREP and WMO, together with regional partners, identify possible strategies for developing a regional training programme that will assist meteorological services of the region to use new technology, in particular, Personal Computer (PC) based software. This activity should focus on the basic principles of PC use including: data entry, file management, maintenance, simple programming and understanding operating systems.

16. The meeting noted recent regional and international initiatives to develop operational climate prediction services. It was agreed that these initiatives held much promise for the Pacific. The group expressed its appreciation for the discussion on the Pacific ENSO Applications Centre and encouraged the United States to continue its support for its operations. The group also expressed its appreciation for the presentations on the WMO Climate Information and Predictions Service (CLIPS) project, and on the recent meeting which discussed the US Government proposal to establish an International Research Institute for Climate Prediction (IRICP). The need to ensure that national meteorological services are developed to serve as the prime channel for linking climate predictions to development planning and policy, was highlighted as an important issue for consideration.

17. It was recognised that the continued supply of high-quality climate data from the national meteorological services of the region will be crucial to the success of these initiatives. Participants also noted the intimate links between the ocean and the atmosphere in the climate system, and the need to secure oceanographic data collection in the region. It was recommended that SPREP undertake to develop a working relationship with the Intergovernmental Oceanographic Commission (IOC) to assist this organisation with its activities in the region.

18. It was recognised that the provision of climate prediction information reconfirmed the need for a regional climate bulletin to ensure the

timely and effective distribution of climate data and information to users. It was recommended that meteorological service directors consider strategies for fostering cooperative links with the user community, and requested SPREP to assist with technical support to ensure climate prediction information is used to further the development of Pacific island countries. In this regard, the meeting urged SPREP to correspond with national meteorological services to compile a summary of relevant experiences in this area which will be distributed to meteorological services in the region.

19. A number of participants expressed concern that on occasions, for a number of technical and administrative reasons, unavailability of consumable equipment caused disruptions to climate monitoring in the region. It was suggested that contact be made with WMO to obtain information on how WMO has addressed this problem in other regions. It was also noted that a sub-regional office in the region would greatly assist in the coordination of such items to ensure climate monitoring continues uninterrupted. It was recommended that SPREP coordinate the preparation of an inventory of climate monitoring equipment, including un-serviceable equipment.

20. The meeting welcomed the achievements to date under the AusAID/ Bureau of Meteorology Pacific Meteorological Services Project and stressed the importance of a continuation of the coordination, provision of equipment, training and maintenance activities initiated under this project.

21. The meeting welcomed the endorsement of the Pacific Island Climate Change Assistance Programme (PICCAP) by the Global Environment Facility (GEF) as the regional initiative of Pacific island parties to the United Nations Framework Convention on Climate Change (UNFCCC), to meet their obligations contained within the Convention. In recognising the importance of meteorological services as centres for knowledge and expertise in the area of climate, the meeting strongly recommended that the meteorological services of the region continue to provide guidance and advice to relevant national and regional agencies and organisations, to ensure that the best possible outputs are achieved from this project.

22. The meeting urged eligible countries which have not done so, to sign and ratify the Framework Convention on Climate Change at their earliest possible convenience.

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South Pacific Regional Environment Programme

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# **MEETING REPORT**

## **Third SPREP Meeting of Regional Meteorological Service Directors**

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## **Introduction**

The Third SPREP Meeting of Regional Meteorological Service Directors was convened in Apia, Western Samoa from 14-16 November 1995, and follows two previous meetings which were held in Port Vila, Vanuatu, from 19-21 October 1993 and Nadi Fiji from 3-5 October 1994. The meeting was funded by the Government of the Republic of China (Taiwan), with assistance from the World Meteorological Organization and the Vaisala (Australia) company.

The objectives of the meeting were to:

- Review on-going activities arising from past meetings;
- Further progress made toward regional cooperation in climate services;
- Consider recent progress made in the area of climate prediction, and the potential benefits such a service might bring to the region; and
- Discuss the working relationship between SPREP and other organisations, including the World Meteorological Organization.

Following the conclusion of the meeting, a one day workshop entitled El Nino/Southern Oscillation Phenomenon and Applications for Climate Prediction was held.

## **Opening Session**

The Minister for Agriculture, Forestry, Fisheries and Meteorology, Hon. Misa Telefoni, delivered the welcome on behalf of the Government of Western Samoa. The Minister referred to the benefits of further education, training and sharing of knowledge among senior public servants, and welcomed Meteorological Service Directors from around the Pacific to Apia. The Minister also noted the important role of Samoa's meteorological services in the future development of his country, and the greater support being provided to the Apia Observatory in this regard.

The Deputy Director of the South Pacific Regional Environment Programme, Mr. Donald Stewart welcomed the delegates on behalf of the Director. He called upon delegates to use this forum to find ways of securing long term cooperation in the Pacific regarding climate services. Mr. Stewart also advised the participants that the outcomes of this meeting will be useful in the forthcoming review of the SPREP Action Plan, which is to be concluded in late 1996.

The Director of the World Meteorological Organization Regional Office for Asia and South West Pacific, Mr. Al-Majed, spoke on behalf of the Secretary General of WMO. Mr. Al Majed outlined the current activities of WMO, and reaffirmed its commitment to the meteorology and climate services in the region, particularly through the programmes and activities of Regional Association-Five.

The provisional Agenda was adopted without amendment, and is included as Annex 2 of this report. The delegate of Western Samoa nominated the delegate of the Cook Islands to Chair the meeting. This was seconded by the delegate from Australia. As there were no other nominations, Mr. Arona Ngari, Manager of the Cook Islands Meteorological Service was elected Chairman by acclamation.

## **Item 1 - Matters Arising from Past Meetings**

The meeting began with a review of activities arising from a number of previous meetings. The SPREP Secretariat reviewed progress of actions in support of recommendations arising from the Second SPREP Meeting of Regional Meteorological Service Directors held in Nadi Fiji from 3-5 October 1994, and the First Meeting of the SPREP Working Group on Climate held in Rarotonga, Cook Islands from 1-3 May 1995. The meeting also heard a presentation from SPREP and

WMO on relevant outcomes of the Twelveth World Meteorological Congress, held in June 1995 in Geneva, Switzerland.

The meeting welcomed the significant progress made in implementing the recommendations of the Second SPREP Meeting of Regional Meteorological Service Directors. However the participants noted that there are still some outstanding issues arising from this, and previous meetings which need to be considered for future action.

The action statements arising from the First Meeting of the SPREP Working Group on Climate were then presented to the meeting. The meeting endorsed these action statements and commended them to SPREP for future guidance. It was recognised that the future work of both the SPREP Meeting of Regional Meteorological Service Directors and the SPREP Working Group on Climate should work closely with the recently established WMO RA-V Working Group on Climate Matters. To this end, the representative of WMO was able to brief the meeting on recent developments, particularly the appointment of Dr. Don Thompson (New Zealand Meteorological Service) to Chair this group.

SPREP and WMO presented information to the meeting on outcomes of the Twelveth World Meteorological Congress relevant to this group. The meeting noted with pleasure the continuation of the close and cooperative working arrangements between SPREP and WMO, which has provided many tangible benefits to meteorological services in the Pacific region, and recommended that these two organisations continue to work closely in support of meteorological services in the region.

The meeting welcomed the initiative of SPREP and WMO to jointly convene a regional workshop on Public Weather Services for the Pacific region. The meeting recommended that both organisations work towards such a workshop to gather together meteorological officers, media, and representatives of the user community for the betterment of public forecasting and warning services in the Pacific.

In the area of climate data, the meeting noted the valuable work undertaken by SPREP to review the use of CLICOM in the region. Some concern was expressed at the future of CLICOM, however WMO assured the meeting that support for

CLICOM would continue in the foreseeable future. A number of training sessions were referred to for 1996, including a proposed Roving Seminar. Vanuatu noted that the planned Roving Seminar should take into account the different needs of countries in the region and called for training in basic computer skills as part of any future training programme.

The meeting requested that SPREP and WMO continue efforts to develop a proposal for the long term security of CLICOM in the Pacific which integrates the requirements for upgrading computer equipment and software as well as staff development and training.

The Cook Islands praised the new satellite receiving equipment pilot project, and recommended that SPREP, in conjunction with WMO and regional partners, implement a second phase of the satellite monitoring equipment project, to provide systems similar to those already installed in the region to other small meteorological services. WMO pledged to support a second phase, and in doing so called for countries in the region to provide funding to the Voluntary Cooperation Fund for this activity.

Finally, Australia recalled the offer by SPREP to serve as a sub-regional office for WMO, and offered to pursue this matter in more detail with the WMO Secretariat.

## **Item 2 - Issues Relating to Regional Climate Programmes**

There was discussion on the provision of climate information to users. It was recognised that climate means and deciles are critical to the effective distribution of climate information, and the meeting asked national delegates to report on the status of the relevant climate means and deciles held within their service. It was immediately clear that there is a large disparity within the region concerning these figures. While some have complete and up to date means and deciles for a number of climate elements, others have no such information, and are also unsure as to how to go about obtaining such information.

Fiji informed the meeting that they have developed a software programme for CLICOM which will read data and calculate deciles. They offered to

provide this software to other users. The Solomon Islands gave an overview of the methodology for determining climate deciles, and described some products they had produced with CLICOM. Niue noted the problems for small meteorological services, and went on to note that without further support and training for CLICOM, they would be unable to utilise their climate data in this fashion.

The Federated States of Micronesia (FSM) informed the meeting of their efforts to compile some climate data on a computer data base, and hoped in the future to be able to provide publications of climate means and deciles. NIWA stressed the need for standard lengths of data (periods of time) in calculating deciles, but noted that incomplete data sets should be used where such lengths of data are unavailable. The Solomon Islands felt support should be provided which would allow each meteorological service to calculate their own deciles. Papua New Guinea noted in this regard that having their own data set and climate deciles was an important factor in protecting each country's national interest.

In conclusion, the meeting expressed concern at the under-developed state of computer based climate databases in the region. The meeting affirmed the importance of high quality climate databases as a fundamental tool in providing climate information for planning and policy purposes. Few meteorological services presently have the required amount of climate data in electronic databases to calculate mean and deciles for climate indices. The meeting noted Project 2, Sub-Project 2.3 of the Changing Climate in Paradise Project which aims to secure existing climate data resources and enter this information into computer data archives. The meeting recommended that this project be given priority as a vital component in the establishment of complete and secure climate databases for Pacific island meteorological services.

The meeting also recognised the need to ensure all historical data is entered into electronic databases as soon as possible. Several countries including Australia and New Zealand, are presently undertaking to format historical climate data from the Pacific to facilitate its input into electronic databases in the region. The meeting urged these countries to continue their efforts, and welcomed the significant improvements in the volume of climate data held in the region that such initiatives will provide.

The meeting considered progress made toward a Pacific regional climate bulletin. The Cook Islands noted the loss of the South Pacific Climate Monitor, formerly prepared each month by NIWA. The delegate from the Pacific ENSO Applications Centre also thanked NIWA, and in particular, Dr. Reid Basher for all he had done in the past, and referred to other documents relevant to the region including the Experimental Long Lead Forecast Bulletin issued by the US National Climate Centre.

The meeting reaffirmed the recommendation of the First Meeting of the SPREP Working Group on Climate, that a new climate bulletin be produced within the islands region through collaboration between Pacific island meteorological services.

It was agreed that a modest approach should be taken initially, with the following climate indices to be reported:

- Pacific climate diagnostics (e.g. SOI, SST anomalies, ENSO text discussion);
- Member generated data (rainfall, and where possible temperature, MSL, pressure and tropical cyclone information);
- Selected other data such as sea-level information, swell, and winds.

Fiji stated that it would be willing to host such a publication, subject to arrangements for provision of resources for the set up and running costs during the early stages. Fiji also pledged to try and absorb much of the costs of continuing this publication in the longer term. Participants agreed that Fiji could provide the basic requirements needed to house such a publication and welcomed their generous offer. SPREP offered to continue liaising with meteorological services and interested organisations in the region to examine practical ways of developing and preparing such a summary, and identify the personnel and resources needed to prepare a project proposal for the establishment of such a bulletin. This was agreed to, and SPREP was asked to provide a progress report to the Fourth SPREP Meeting of Regional Meteorological Service Directors.

Discussion then turned to the issue of regional support for CLICOM in the Pacific. Two consultant reports have been completed for SPREP showing that CLICOM is in a particularly fragile

state in the Pacific region. Australia noted the planned four week course for CLICOM users to be convened by the Bureau of Meteorology in July 1996. American Samoa noted that such courses should also include training in basic climatology. Australia offered to include courses on climatology for Pacific island countries, either in addition to, or as part of, existing courses provided by the Bureau of Meteorology. Niue welcomed this offer. NIWA recalled recommendations from the First Meeting of the SPREP Working Group on Climate, which specified Climatology and Personal Computer skills training as a priority for the region. The Solomon Islands concurred, and noted that recommendations of previous SPREP Meetings of Meteorological Service Directors had made similar calls.

The meeting requested SPREP and WMO to work together, in liaison with the meteorological services in the region, to prepare a proposal for a detailed regional support programme for CLICOM. The programme should be developed in line with the five principles outlined in the Summary of Action Statements from the First Meeting of the SPREP Working Group on Climate. SPREP is urged to continue its efforts to prepare this proposal, and seek comment from Pacific island countries, regional partners and international organisations to ensure that the project will provide optimum assistance in conjunction with other related programmes.

A synthesis document of training resources available in the Pacific region was prepared for the meeting. While not comprehensive, it provided participants with some useful insight to the training packages offered within the region, and externally. The meeting welcomed the preparation of this register of relevant meteorological training courses and material available to the region, and recommended that it be regularly updated, and made available to the meteorological services of the region.

WMO referred to the importance of training in the activities of WMO and the large number of training courses convened or co-sponsored by WMO. Particular reference was made to the courses available to the new WMO members in the Pacific. Countries were urged to identify their needs and inform WMO so that they can respond. A number of countries spoke in praise of WMO for their initiatives to support training. Vanuatu reflected on their own situation, and spoke of the

need to develop forward plans to assess both the basic and more specialised training needs. The Pacific Meteorological Services Project was praised on their support for basic training in meteorological observations, an important element for securing climate services in the Pacific. Several countries spoke of the training provided locally within the region and urged that these facilities be utilised better by the meteorological services of the region. It was pointed out that information on training courses available in the region should be made more widely available, and in particular should be included in future revisions of the training resources for the Pacific.

American Samoa thanked Australia and WMO for the forthcoming course on Tropical Cyclone Forecasting, which will provide valuable training for South Pacific tropical cyclone forecasters. Australia noted that there had been little mention in the past of management training for meteorological service staff, and emphasised that training is as important as the technical training in order to ensure efficient and effective use of manpower and resources.

Australia advised that the Bureau of Meteorology would be running a second course for meteorological technical officers from 12 March to 18 October 1996. The Cook Islands thanked Australia for the success of the first course, noting the improvement in services provided by those staff who had completed the training. The Solomon Islands emphasised the need for ongoing staff training to improve both the skill and morale of staff, and added praise to others in welcoming the useful course conducted by Australia. Vanuatu, Papua New Guinea and Fiji also added their voices to this vote of thanks.

The Federated States of Micronesia thanked Australia for training provided under the South Pacific Sea Level and Climate Monitoring Project, and WMO for encouraging their involvement in various training programmes they have offered, and noted the need within their service for more basic training in meteorology.

The training areas of computer techniques (including programming skills), understanding CLICOM, climate science, statistics, agro-climatology, and community involvement and applications were specifically identified as areas where regional coordination would be beneficial. Participants noted with appreciation the training

provided by WMO, Australian Bureau of Meteorology, and NIWA (New Zealand), which has provided a foundation of basic knowledge within the region. The meeting recommended that the Regional CLICOM Development Project proposal address fully the training assistance identified in the CLICOM Inventory and Review document.

### **Item 3 - Climate Prediction: Opportunities for Regional Meteorological Services**

Presentations were made by four organisations outlining recent activities to promote climate prediction services within the Pacific region and internationally. WMO have developed CLIPS, which aims to link climate monitoring programmes with information for users on climate information and forecasts. It was noted that CLIPS and the WMO Global Climate Observing System (GCOS) have many similar goals, and that CLIPS will “dovetail” to a large extent with this existing programme. It was pointed out that CLIPS is a framework within which existing activities are integrated. Australia emphasised that CLIPS must not oversell itself initially. The skill is still limited at this time, however climate prediction promises much for the future, and the Pacific region stands to benefit greatly from this important new area of climate science.

It was recalled that the Eleventh Session of WMO Regional Association Five (RA-V) made a number of comments relating to climate predictions, notably the need for meteorological services to work more closely with applications sectors in order to avoid being marginalised. It was stressed at this forum that meteorological services should be the channel through which the benefits of CLIPS are passed to the community. The Cook Islands stressed that climate data from the Pacific would be central to the success of regional and international climate predictions, and that this fact should be recognised in programmes such as GCOS.

The United States have established a pilot operational climate prediction service for a limited number of Pacific islands which have traditionally fallen under their influence. The service is provided by way of regular (quarterly) bulletins

from the Pacific ENSO Applications Centre in Honolulu. The seasonal climate forecasts are based on computer predictions from various research centres in the United States. So far the forecasts have been used with some success by a variety of users within the Pacific islands.

New Caledonia welcomed the initiative, but urged caution by noting that ENSO does not explain all of the variability of the climate in the Pacific. For example, a singular short lived event such as rain associated with a tropical cyclone can bring about average monthly or seasonal rainfall during a period of drought. The Pacific Basin Development Council agreed, and noted that problems such as these highlight the need for users and meteorological services to work closely to ensure that information provided by the meteorological services and the applications centres are relevant to the users.

American Samoa stated that information from this centre had been used operationally and had proven useful in a number of decisions made during the commencement of the present tropical cyclone season. Cook Islands made the point that ENSO has a large influence on where tropical cyclones formed over their territory, and noted that such information would be important for many people in the Cook Islands. FSM told the meeting that information from their quarterly bulletins have been distributed regularly to a variety of users in FSM.

The Solomon Islands sought more detail on the distribution of the bulletin. The meeting was informed that the document is sent to a variety of users, including meteorological services. The Cook Islands highlighted the importance of the meteorological services in analysing and interpreting climate information, and requested that due consideration be given to ensuring they receive the bulletin initially so that they may answer queries from the public in reference to the material contained in the bulletin.

A brief summary of initiatives to date was presented to establish an International Research Institute for Climate Prediction (IRICP). A major international meeting was held from 6-8 November 1995 in Washington DC, convened by the US Government to solicit support for an international cooperative effort to develop a global climate prediction facility. The meeting heard that the 290 participants from 40 countries and several

organisations present, were all supportive in principle, for the concept. It was agreed by the meeting that this activity should be closely followed in the future, and that Pacific island governments should encourage the establishment of the IRICP somewhere within the Pacific Basin.

A presentation on the important role of oceans in the climate system was made by the French Institute for Scientific Research for Development through Cooperation (ORSTOM). The close link between the Global Ocean Observing System (GOOS) and GCOS were noted by the meeting. It was agreed that there should be more interaction nationally and regionally between meteorological services and the Intergovernmental Oceanographic Commission. ORSTOM noted that ocean observing systems are very expensive, and international cooperation is required in order to establish long term ocean monitoring networks. ORSTOM noted the formal relationship established between SPREP and WMO, and encouraged SPREP to consider a similar arrangement with IOC.

The participants discussed the future role of meteorological services in climate prediction. It was recognised that the provision of climate prediction information reconfirmed the need for a regional climate bulletin to ensure the timely and effective distribution of climate data and information to users. Particular mention was made also of the need for meteorological service directors to look at ways of fostering cooperative links with the user community. The meeting requested SPREP to assist with technical support to ensure climate prediction information is used to further the development of Pacific island countries. This can be done by corresponding with national meteorological services to compile a summary of relevant experiences in this area, which will be distributed to meteorological services in the region.

## **Item 4 - Other Issues**

The United States Department of Energy presented an overview of the activities included in their Atmospheric Radiation Monitoring (ARM) programme in the tropical western Pacific. An array of instruments to monitor clouds, solar and terrestrial radiation and other climate elements are planned for installation along the equator in the western and central Pacific. The first site, at Momote Airport, Manus Island, is expected to

commence operations in mid 1996. Future sites are planned for Nauru and Kiribati.

Project Manager for the Pacific, Dr. Clements noted the close working relationship established between ARM and the Papua New Guinea National Weather Service (PNG NWS). Under this programme, PNG NWS staff will oversee the daily monitoring programme, help with basic maintenance of instruments and assist in data logging and retrieval. A number of staff from PNG NWS have already received training and on the job instructions, while further training courses will be convened in the future as the project evolves.

Another aspect of ARM raised in the presentation was their work with SPREP on education and public awareness. A sub-contract has been signed between SPREP and ARM, and together both organisations will develop a programme of education and public awareness to support the ARM programme. SPREP noted that some specific tasks would include information for the media, development of school curricula on climate, and helping local scientific and research institutions, including schools and universities, analyse and interpret the data gathered by the ARM network of instruments.

The meeting heard from the delegate from the Australian Bureau of Meteorology on the Pacific Meteorological Services Project (PMSP). The project has been underway for two years, and has provided assistance to a number of countries in the region. The project aims to improve climate monitoring by strengthening climate observation sites in the Pacific, training local meteorological staff in operating and maintaining the instruments, as well as training in climate data gathering. Through this project, it has been possible to develop standard instrument networks and references, which will improve the quality of climate data bases in the Pacific.

Western Samoa acknowledged with thanks the efforts of PMSP which, together with the automated stations provided by the United States of America, have led to a significant improvement in the network of meteorological stations. Niue also thanked Australia for their assistance, and at the same time expressed its gratitude to New Zealand for the continued support it provided for meteorological services in Niue. Some effort has been made to improve the technical support for instruments in Niue, however it is likely that

problems such as instrument calibration will require external assistance for some time. Tonga added their thanks also to Australia for their important assistance under PMSP.

Papua New Guinea welcomed the contribution of PMSP, and noted that Australia had provided much assistance to meteorological services through a number of projects funded by the Australian Agency for International Development (AusAID). It is hoped that on-going support would continue beyond the life of present projects. This sentiment was echoed by the Solomon Islands, who praised the high quality of assistance provided by AusAID through their many projects. The Cook Islands noted that this project was a good example of how regional cooperation ensured that the sum of the benefits across the region exceeded the individual components of the project in each country.

Following expressions of concern at past meetings, participants wished to discuss how the region might share consumable items required for climate monitoring. A number of countries noted that their climate data gathering programmes had been disrupted due to shortages in consumable items such as charts, balloons, radiosondes, etc. Most of the consumable items are imported from outside the region, and have limited shelf life. This meant that meteorological services were often carrying minimum amounts of such items. When coupled with irregularities in government budget cycles, this often led to extended periods where all items were exhausted while meteorological services waited for new items to arrive. Problems of a similar nature were also experienced with spare parts for important equipment, e.g., electrolytic hydrogen generators.

In the past, this problem has been partially offset through informal arrangements between neighbouring countries whereby such items are shared pending the arrival of new stocks. The discussion focused on ways in which this informal cooperative could be improved. It was suggested that contact be made with WMO to obtain information on how WMO has addressed this problem in other regions. It was suggested that a sub-regional office in the region would greatly assist in the coordination of such items to ensure climate monitoring continues uninterrupted.

New Caledonia, supported by Papua New Guinea, suggested that an inventory of climate monitoring

equipment (including equipment which are un-serviceable), be prepared and distributed around the region. The representative of PMSP agreed that such a list would be useful. The Cook Islands noted the valuable assistance provided by the Vaisala company to meteorological services in the region.

SPREP presented a summary of activities leading to the preparation of the Pacific Island Climate Change Assistance Project. This project document has been prepared to assist a number of Pacific island countries (Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Solomon Islands, Tuvalu, Vanuatu and Western Samoa) meet their obligations contained in the United Nations Framework Convention on Climate Change. It contains a focused programme of activities to undertake national greenhouse gas inventories, and initial communications of Pacific island countries.

The proposal does not include Papua New Guinea, as their size and national priorities require a separate programme to meet their concerns. Niue, Tonga and Palau were not included as they are not yet parties to the Convention.

The six key objectives of the project are:

- to prepare greenhouse gas inventories;
- identify mitigation strategies;
- report on vulnerability and resilience to climate change;
- identify adaptation options;
- develop national implementation plans for climate change policy; and
- prepare initial national communications as required under the UNFCCC.

The project was prepared to complement existing activities either underway or planned in the region. These include the existing Country Studies Program sponsored by the United States of America, and the on-going projects on Vulnerability and Adaptation being undertaken by the Government of Japan. A significant component of the project, the regional training activities, are to be undertaken as part of the Climate Change: Training (CC:TRAIN) Phase 2.

The Pacific Islands Climate Change Assistance Project is a regional project prepared by SPREP to enable Pacific island countries to meet their obligations under the UNFCCC. It has been approved for funding by the GEF Council, and is

expected to commence later in 1996. On completion, nine Pacific island countries who are Parties to the UNFCCC will have:

- prepared their initial national communication;
- prepared national implementation plans;
- identified mitigation and adaptation strategies; and
- prepared a comprehensive greenhouse gas inventory.

Further, key national government staff will have been trained to ensure future national development activities take into account climate change issues.

The meeting thanked SPREP for its efforts to develop this project and endorsed it as an important future activity in the region. It was agreed that meteorological services should be central to the national and regional effort to prepare the various reports required under the UNFCCC. Niue noted that they expect to become a Party to the UNFCCC shortly, and asked to be considered for inclusion in PICCAP.

There being no other business, the meeting was closed on 15 November 1996. Following the meeting, a one day workshop entitled El Nino/Southern Oscillation Phenomenon and Applications for Climate Prediction was convened on 16 November 1996.



## Annex 1            Agenda

### Day One

- 0900-1000      Registration
- 1000-1030      Morning Tea
- 1030-1100      Official Opening
- i.      Opening Prayer
  - ii.     Welcoming remarks from Government of Western Samoa
  - iii.    Opening remarks by SPREP
  - iv.    Introduction from WMO
  - v.     Photograph
- 1100-1110      Approval of Agenda, Election of Chairperson.

### Item 1:      **Matters Arising from Past Meetings**

- 1110-1140      (a) Recommendations of the Second SPREP Meeting of Regional Meteorological Service Directors, October 1994, Nadi, Fiji
- 1140-1200      (b) Action Statements from the First Meeting of the SPREP Working Group on Climate May 1995, Rarotonga, Cook Islands.
- 1200-1330      Lunch.
- 1330-1400      (c) Matters arising from Twelveth World Meteorological Congress.

### Item 2:      **Issues Relating to Regional Climate Programmes**

- 1400-1430      (a) Status of relevant climate means and deciles in Pacific island countries.  
*(Reports by all delegates)*
- 1430-1500      (b) Progress toward a Pacific regional climate bulletin.
- 1500-1530      Afternoon Tea.
- 1530-1600      (c) A proposal for a regional support programme for CLICOM in the Pacific islands.
- 1600-1630      (d) Meteorological Training Needs Analysis for Pacific island countries.
- 1630-1700      (e) Status of Pacific island climate data bases.
- 1830-2030      Welcome reception (Apia Observatory)

## Day Two

### Item 3: Climate Prediction: Opportunities for Regional Meteorological Services

- 0830-0900 (a) WMO Climate Information and Prediction Service (CLIPS).  
0900-0930 (b) Pacific ENSO Applications Centre.  
0930-1000 (c) Review of International Research Institute for Climate Prediction (IRICP) proposal.  
1000-1030 (d) Overview of activities of ORSTOM in El Nino and Climate Prediction  
1030-1100 Morning Tea.

### Item 4: Other Issues

- 1100-1130 (a) Strategies for improving relationships between climate information services and the user community.  
1130-1200 (b) Discussion on a regional strategy for the provision and exchange of consumable items between meteorological services.  
1200-1230 (c) The US Department of Energy Atmospheric Radiation Monitoring (ARM) Project  
1300-1430 Lunch.  
1430-1500 (d) The AusAID/ Bureau of Meteorology Pacific Meteorological Service Project.  
1500-1530 (e) The SPREP Pacific Islands Climate Change Assistance Project (PICCAP)  
1530-1600 Afternoon Tea.  
1600-1645 Summary of discussions and adoption of meeting recommendations.  
1645-1700 Closing prayer.  
1700-1710 Meeting Close.

## Day Three

### **Pacific Island Workshop on El Nino/Southern Oscillation (ENSO) and Applications for Climate Prediction**

- 0830-1030      **The Science of the El Nino - Southern Oscillation.**  
*Presentation by Dr. Reid Basher of New Zealand National Institute for Water and Atmospheric Research (NIWA), followed by discussion.*
- 1030-1100      Morning Tea
- 1130-1300      **Climate Prediction Techniques.**  
*Presentation by Mr. Alan Hilton, Pacific ENSO Applications Centre, Honolulu, followed by discussion.*
- 1300-1400      Lunch
- 1400-1530      **Strategies for including Climate Predictions and Information in National Development Plans.**  
*Presentation by Dr. Michael Hamnett, Pacific Basin Development Council, Honolulu, followed by discussion.*
- 1530-1600      Afternoon Tea
- 1630-1730      **Adapting Climate Predictions for the User Community.**  
*Group discussion moderated by Reid Basher, Alan Hilton, Michael Hamnett and Dr. Jacques Merle, ORSTOM, Noumea.*

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